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ABSTRACT

This paper reports on an experiment undertaken to delineate more clearly the relationship between the naming process in children and certain aspects of the environment which may play a role in that process. The investigation concerned the effect of manipulation and of object novelty on naming. Sixteen children, ten girls and six boys, ranging in age from 16 to 23 months, were tested in their homes. The objects used in the experiment were selected so as to vary along the dimension of novelty. The children were shown objects familiar to them as category items, objects less familiar but still members of familiar conditions: the manipulation (M) condition in which the child was shown the object as it was named, and the non-manipulation condition (NM) in which the child did not handle the object. In each condition, the experimenter repeated the name of the object three times during the conversation with the child. Presentation conditions were alternated for each object continuing until all objects had been presented. It was found that manipulation does not have any significant effect on naming but that familiarity is a strong factor. A possible explanation is that familiar objects were more often named since the child did not also have to engage in concept formation and thus could direct his energies to naming. (AMH)

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# THE EFFECTS OF OBJECT MANIPULATION AND OBJECT NOVELTY ON NAMING IN YOUNG CHILDREN*

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The connections among the development of the word, the concept, and the object have recently been investigated by various researchers. Of most interest to those involved with this topic is the second year of life. At the age of twelve months, the average child is just beginning to use a few words; his vocabulary will continue to grow by slow accretion until, at approximately 18 months of age, it takes a sudden spurt. The child then begins to acquire words at a rapid pace, a phenomenon which will continue for the next few years. It is evident that a rather efficient means of categorizing objects and applying names to them must be available to the young child. However, the variables which affect the aequisition of names for objects have not been sufficiently studied to give a clear account of this process. The research reported here was undertaken with the purpose of more clearly delineating the relationship between the naming process in children and certain aspects of the environment which may play a role in that process.

Although there has recently been a great deal of interest in and research about the one-word stage, there is still little known about how the correspondences between the child's cognitive system and language system develop. We do not know the variables which determine which objects children will name and which they will not; nor do we know what the effect of naming is on the developing cognitive system.

This research explored the effects of two variables-manipulation and novelty of objects-on amount of naming done by young children. Since Piaget, we have learned to think of the young child as a sensorimotor creature whose physical interactions with the world affect in subtle ways his understanding of that world. In light of this, it is not unreasonable to expect that the child's manipulation of objects will affect his use of words for objects. However, it is not clear in what ways manipulation might affect naming. Keith Nelson & Bonvillian (1973), in the course of a study on the ways children learn names for novel concept instances, found that there was a high negative correlation between amount of manipulation of novel objects and amount of naming in 16-24 month olds, contrary to their original hypothesis. In light of these data, Nelson & Bonvillian sug-

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gested that, at least for young children, naming an object is an active means of categorizing the object in the same way that manipulation is. Object manipulation and naming are alternative means of action on the object for the young child. However, it is still not clear in this account why manipulation and naming should be negatively correlated.

The opposite claim, that manipulation should aid naming, was the one that Nelson & Bonvillian originally started out with, and there are other theorists who would make the same claim. Katherine Nelson (1973, 1974) has stated that the child's active interrelationships with objects leads to greater discriminability of objects. Names are then directly applied to the object. Thus, manipulated objects will be most easily named.

Although both Nelson & Bonvillian's and Katherine Nelson's theories regard action on an object as providing greater discriminability of the object, the relationship that they see between object manipulation and subsequent naming differs. In Katherine Nelson's theory, manipulating objects leads to concept formation; concept formation is directly reflected in naming; thus, object manipulation should lead to a direct increase in naming. This is a theory which sees the correspondence between language and cognitive systems as a direct one. Nelson & Bonvillian's theory is somewhat different; both object manipulation and naming serve to delineate concepts in the same way: they are both forms of action on the object. In this view, objects which are manipulated should be named less than objects which are not manipulated, since naming of manipulated objects is less necessary to categorize the object. Nelson & Bonvillian's study had been essentially an observational, correlational one. In the present study, it was decided to attempt to systematically vary manipulation conditions in order to determine whether any reliable effects on naming could be obtained, and to see whether these two conflicting theories could be reconciled.

The other variable of interest was object novelty. There were a couple of reasons for deciding to study novelty. First, Nelson & Bonvillian had used only novel objects in their study. It was possible that the manipulation finding would differ according to the degree of novelty of the object. Specifically, more familiar objects may be handled in a different manner or for different amounts of time than novel ones. Such differences could affect naming. Second, novelty is a variable of interest in its own right because of its relationship to concept formation. Some theories, such as Katherine Nelson's, (1973, 1974) have assumed a direct relationship between concept formation and naming. In Nelson's theory, concepts are determined by the functional relationships that a child enters into with an object; names are assumed to isomorphically reflect these relationships. Thus, the names the child will learn are supposed to be the names for the most functionally relevant objects in the

child's environment. However, we cannot say with any assurance that the relationship between concept formation and naming is a direct one. Part of this relationship was looked at by systematically varying the degree of novelty of the objects presented to the child. The degree of a child's familiarity with an object was used as a gauge of whether or not the child had a concept of the object. Specifically, more familiar objects were assumed to be concept instances; less familiar ones, either not parts of concepts or only in the process of becoming concepts.

Thus, there were two questions being asked. First, what is the effect of manipulation on naming of objects? If object manipulation and naming are alternative means of action on the object, then objects which are manipulated should be less named than objects which are not manipulated. If, on the other hand, actions on objects help to discriminate object classes, then those objects which are manipulated should be named more often than objects not manipulated.

Second, what is the effect of object novelty on naming? If naming directly reflects concept formation, then greater naming should occur with the most familiar objects, since the child presumably already has concepts for these. If, on the other hand, the relationship between concept formation and naming is not a fairly direct one, then amount of naming will not be dependent upon the child's familiarity with objects.

Method

Subjects. The subjects were 16 children, ten girls and six boys, ranging in age from 16 to 23 months. One girl and one boy were dropped from the experiment because of inability to complete it, leaving a total of 14 children with a mean age of 20.3 months. When the mothers were first contacted, by telephone, they were asked about (a) the language status of the child, specifically whether the child was producing words, and (b) the child's knowledge of the objects used in the experiment. All of the children were productive language users.

Items. The objects used in the experiment were selected so as to vary along the dimension of novelty. There were three groups of objects, consisting of four items each, for a total of twelve objects. Group I consisted of objects which were familiar to the children as category items, although the children were not familiar with the particular items used in the experiment. Group II objects were also members of familiar categories, but were sufficiently different from the usual items designated by the category name as to be unfamiliar to the child. Group III consisted of objects which the children had no experience with, as individual items, as members of a category, or as names for an object or category. Table 1 gives a description of the object groups, along with the particular items used in the experiment.

Procedure. All of the children were tested in their homes. Each child was presented with twelve objects in the same order. The procedure

Table 1

Descriptions of Object Groups

Group I - Familiar Tokens/Familiar Types
Interview with mother indicated that children knew a variety of objects by these names. The objects that the children knew were similar to the objects used in the experiment.

| Object Descriptions | Label used by E |
|---|---|
| medium-sized green ball | ball |
| blue plastic cup | cup |
| white infant's shoe | shoe |
| brown plastic figure of dog | dog |

Group II - Novel Tokens/Familiar Types
Interview with mother indicated that children knew a variety of objects by these names. None of the known objects, however, were very similar to the objects used in the experiment.

| Object Descriptions | Label used by E |
|---|---|
| dog's wire grooming brush | brush |
| stop watch | watch |
| sauce spoon with sharp tip | spoon |
| long thin skeleton key | key |

Group III - Novel Tokens/Novel Types
Interview with mother indicated that children were not familiar with these objects at all, either as individual itrms or as categories.

| Object Descriptions | Label used by E |
|---|---|
| small hand drill | drill |
| small metal bolt | bolt |
| medium-sizes wire whisk | whisk |
| medium sized wood clamp | clamp |

was as follows: the experimenter removed the first object from a bag, sat down near the child, and presented the object to the child. What happened next in the procedure depended upon which presentation condition was being used for the object. There were two presentation conditions: in the manipulation (M) condition, the object was handed to the child as the experimenter said the name of the object. The child was then permitted to play with the object as he wished. In the non-manipulation (NM) condition, the child was not permitted to handle the object. Instead, the experimenter held the object in her hand, while saying the name of the object, and then placed the object on the floor beside her. The object was placed so that it was still easy for the child to see it.

Regardless of presentation condition, the rest of the procedure was basically the same. In each case, the experimenter repeated the name of the object twice more, for a total of three namings, during the course of conversation with the child. Comments about the object were made only

when the experimenter felt that the child was attending to the object. References to specific perceptual or functional aspects of the object were avoided. When the child appeared to lose interest in the object, or after a time span of five minutes, whichever was shorter, the object was removed and the next object was presented. In general, most children lost interest in the object before the allotted time span was over. The object was then immediately removed and the next object presented.

The children were separated into two groups. One group received the M condition first, and the other group received the NM condition first. The presentation conditions were then alternated for each object, continuing until all twelve objects had been presented. The twelve objects were presented in the same order to all children.

The dependent variable of interest was naming, specifically, whether there would be differences in naming between the two conditions of presentation and among the three groups of objects. Scoring was done as follows: any trial in which the child named the object was given a score of 1; any trial in which the child did not name the object was given a score of 0. Subsequent namings of the object, if any, were not scored.

Results/Discussion. A two-way analysis of variance for repeated measures was performed. The results of this analysis and the mean amount of naming for the three groups of objects and two presentation conditions can be seen in Table 2. The main effect of manipulation was not signifi-

Table 2

Mean object naming as a function of novelty and manipulation

| | Group I | Group II | Group III | |
|---|---|---|---|---|
| M | 1.500 | 0.857 | 0.357 | 0.905 |
| NM | 1.143 | 0.786 | 0.571 | 0.833 |
| | 1.321 | 0.821 | 0.464 | 0.869 |

Manipulation $F$ (1, 13) = 0.218, $p > 0.5$
Novelty $F$ (2,26) = 16.970, $p < .001$
Manipulation x Novelty $F$ (2,26) = 2.537, p .099

Scheffe Test : Group I > Group II > Group III

cant; children named objects as often when they manipulated them as when they did not. There was, however, a significant main effect of novelty. If we look at the means for the three groups of objects, we can see that the amount of naming decreases as the novelty of the objects increases.

The differences among the means for the three groups of objects were all found to be significant. In general, then, more familiar objects are named consistently more often than novel items.

The manipulation finding indicates that children are not any more likely to name an object when they have played with it than when they have only observed it. This disputes the findings of both Nelson & Bonvillian and Katherine Nelson.

It is possible that the effects of manipulation might show up only over a more extended period of time. Nelson & Bonvillian's analysis occurred at the ninth and tenth sessions, at which time the children had been involved in the study for four months. If it is the case that these effects turn up only in a longitudinal study, however, then they would say less about how the child learns names than about how he chooses to apply names, since the child would presumably have learned a great many of the names used at that time by the ninth and tenth sessions.

While manipulation of objects did not result in less naming, it also did not result in significantly more naming. Action on objects does not seem to result in significantly more discrimination of objects, at least none that can be observed in increased naming. Children's actions on objects may not be as useful to them as might be expected from a theory such as Katherine Nelson's. Young children apparently are more than sensorimotor creatures who learn largely through action.

However, some of the above conclusions are somewhat tempered by the interaction effect. The interaction of manipulation and novelty, although it did not reach significance, did tend towards it, as can be seen in Table 2. An inspection of the means indicates that when familiar objects are manipulated, more naming occurs than when they are not manipulated; with novel objects, manipulation results in less naming than non-manipulation. The finding that novel objects are named more often when they are not manipulated does seem to uphold Nelson & Bonvillian's findings. However, it should be noted that Nelson & Bonvillian's objects were not truly novel at the time of their findings, as discussed above.

Another way of looking at the means of Table 2 is that manipulation seems to potentiate differences among the three groups of objects. It is as if manipulation provides knowledge about what sort of object the child is interacting with, in this case the relative familiarity of the object. In this way, action on an object might be said to provide some knowledge about the object, even though this knowledge is not always directly reflected in naming.

The significant effect of object groups indicates that familiarity is a strong factor in naming. Children most often name the objects that they are familiar with. It had been originally hypothesized

that if naming directly reflected concept formation, then greater naming should be found for the most familiar objects. This was exactly what happened. If we look at the results in terms of the relationship between the object groups and concept formation, we can see that the Group I items were already concept instances; the Group II items were new members of already known categories; and the Group III objects were completely novel objects, which presumably introduced the child to new categories. Naming, then, is more likely for established category members than in those cases where concepts are just forming. If we consider naming and concept formation to be two relatively independent processes, then we can explain the familiarity finding by saying that familiar objects were more often named since the child did not also have to engage in concept formation, and thus could direct his energies to naming. When confronted with novel objects, however, most of the child's energy went to categorizing and concept formation, and thus the added behavior of naming proved to be more difficult for the child.

The relationship between the objects used in this experiment and the degree of concept formation has been inferred and is an indirect one. It could be argued that it is not necessary to make such inferences, that it is enough to say that children name more familiar objects. However, even if we do not want to make this inference, we are still left with a problem. To say that children name familiar objects more easily is not enough, since we must then decide what we mean when we use the word familiar. We will probably have to break down the concept of familiarity into more specific components. One possibility is that the objects differed for the child in terms of perceptual familiarity. This would fit in with a theory such as Clark's (1973), in which extensions of known words are based largely on perceptual dimensions. Perceptually familiar objects would be most easily labelled, then, while perceptually novel objects would be less easy to label. This is precisely what occurred in this experiment. Further research will be needed however, to determine whether perceptual familiarity, or some other construct sych as functional familiarity, provides the best account for these data.

## REFERENCES

Clark, E.V. What's in a word? On the child's acquisition of semantics in his first language. In T.E. Moore (ed.), Cognitive development and the acquisition of language. New York: Academic Press, 1973.

Nelson, Katherine. Some evidence for the cognitive primacy of categorization and its functional basis. Merrill-Palmer Quarterly, 1973, 19, 21-39.

Nelson, Katherine. Concept, word, and sentence: interrelations in acquisition and development. Psychological Review, 1974, 81, 267-285.

Nelson, K.E., & Bonvillian, J.D. Concepts and words in the 18-month-old: acquiring concept names under controlled conditions. Cognition, 1973, 2, 435-450.

Piaget, J. Play, dreams, and imitation in childhood. New York: The Norton Company, Inc., 1962.